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               MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP),
               AND CURRENT DISCOVER FILE IS DATED 25 SEPTEMBER 2006.

 NEWS HOURS    STN Operating Hours Plus Help Desk Availability
 NEWS LOGIN    Welcome Banner and News Items
 NEWS IPC8     For general information regarding STN implementation of IPC 8
 NEWS X25      X.25 communication option no longer available

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FILE 'HOME' ENTERED AT 10:54:49 ON 14 NOV 2006

=> file registry
COST IN U.S. DOLLARS                                  SINCE FILE     TOTAL
                                                           ENTRY   SESSION
FULL ESTIMATED COST                                         0.21      0.21

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DICTIONARY FILE UPDATES:  12 NOV 2006  HIGHEST RN 913055-81-9

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http://www.cas.org/ONLINE/UG/regprops.html

=> s astaxanthin diacetate/cn
L1             1 ASTAXANTHIN DIACETATE/CN

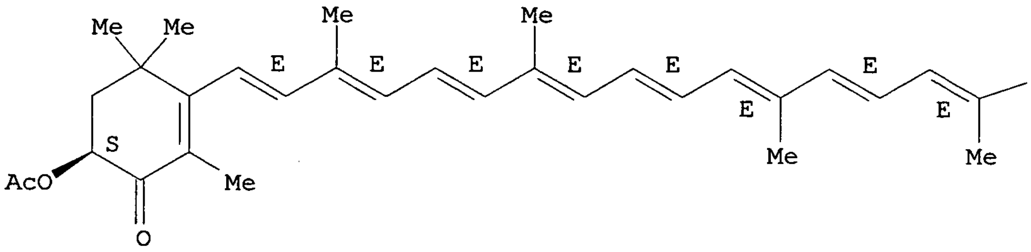
=> d

L1   ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2006 ACS on STN
RN   25494-88-6  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI)
     (CA INDEX NAME)
```

```
OTHER CA INDEX NAMES:
CN   β-Carotene-4,4'-dione, 3,3'-dihydroxy-, diacetate, all-trans- (8CI)
OTHER NAMES:
CN   all-trans-(3S,3'S)-Astaxanthin diacetate
CN   Astaxanthin 3,3'-diacetate
CN   Astaxanthin diacetate
FS   STEREOSEARCH
DR   2485-58-7, 69350-55-6, 5800-87-3
MF   C44 H56 O6
LC   STN Files:   BEILSTEIN*, CA, CAOLD, CAPLUS, SPECINFO, USPATFULL
         (*File contains numerically searchable property data)

Absolute stereochemistry.
Double bond geometry as shown.

                                                           PAGE 1-A
```



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                                                           PAGE 1-B
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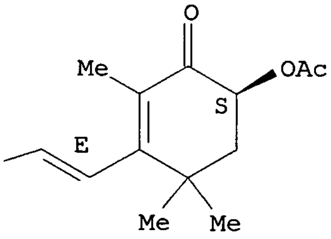

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**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

              13 REFERENCES IN FILE CA (1907 TO DATE)
              13 REFERENCES IN FILE CAPLUS (1907 TO DATE)


=>  FILE REG

COST IN U.S. DOLLARS                                  SINCE FILE     TOTAL
                                                           ENTRY   SESSION
FULL ESTIMATED COST                                        10.18     10.39

FILE 'REGISTRY' ENTERED AT 10:59:46 ON 14 NOV 2006
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DICTIONARY FILE UPDATES:   12 NOV 2006  HIGHEST RN 913055-81-9

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http://www.cas.org/ONLINE/UG/regprops.html

=> STR 2485-58-7

REGISTRY NUMBER HAS BEEN REPLACED BY '25494-88-6'
:END

L2   STRUCTURE CREATED

=> S L2 EXA SAM

SAMPLE SEARCH INITIATED 10:59:50 FILE 'REGISTRY'
SAMPLE SCREEN SEARCH COMPLETED -        3 TO ITERATE

100.0% PROCESSED        3 ITERATIONS                              1 ANSWERS
SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS:  ONLINE  **COMPLETE**
                        BATCH   **COMPLETE**
PROJECTED ITERATIONS:            3 TO      163
PROJECTED ANSWERS:               1 TO       80

L3             1 SEA EXA SAM L2

=>

=>  D SCAN


L3   1 ANSWERS   REGISTRY  COPYRIGHT 2006 ACS on STN
IN   β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S,13-cis)-
     (9CI)
MF   C44 H56 O6

Absolute stereochemistry.
Double bond geometry as shown.
```
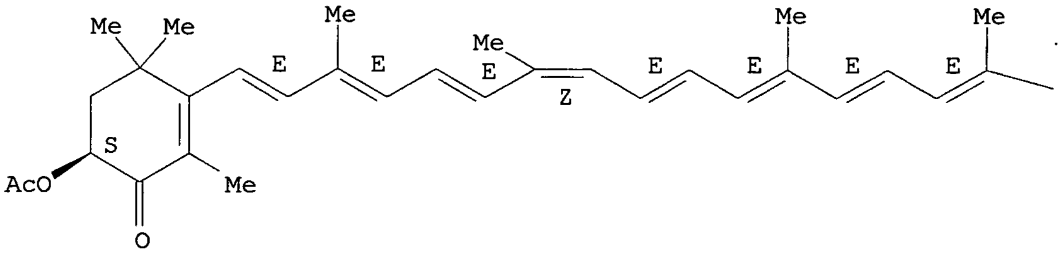
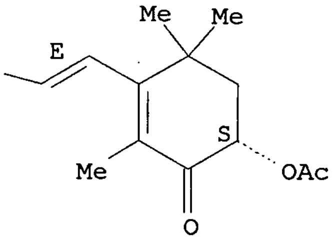

PAGE 1-A



PAGE 1-B



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**


ALL ANSWERS HAVE BEEN SCANNED


=>  FILE REG

COST IN U.S. DOLLARS                             SINCE FILE      TOTAL
                                                      ENTRY    SESSION
FULL ESTIMATED COST                                    0.44      10.83

FILE 'REGISTRY' ENTERED AT 11:00:16 ON 14 NOV 2006
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DICTIONARY FILE UPDATES:   12 NOV 2006  HIGHEST RN 913055-81-9

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  Please note that search-term pricing does apply when
  conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and
predicted properties as well as tags indicating availability of
experimental property data in the original document.  For information
on property searching in REGISTRY, refer to:

http://www.cas.org/ONLINE/UG/regprops.html
```
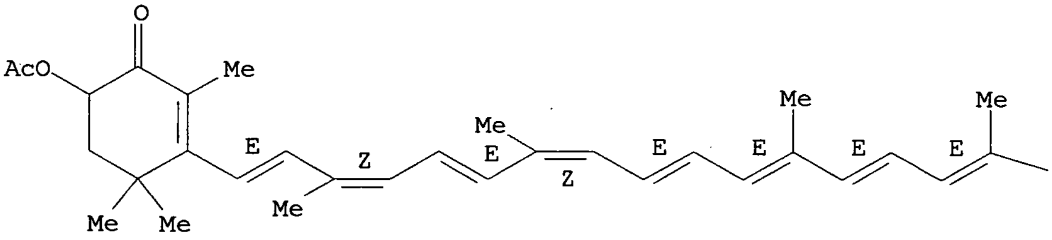
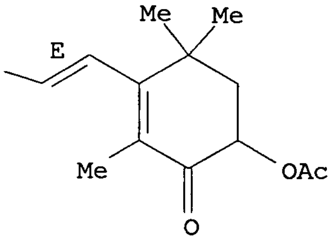

```
=> STR 69350-55-6

REGISTRY NUMBER HAS BEEN REPLACED BY '25494-88-6'
:END

L4   STRUCTURE CREATED

=> S L4 EXA FUL

FULL SEARCH INITIATED 11:00:19 FILE 'REGISTRY'
FULL SCREEN SEARCH COMPLETED -       92 TO ITERATE

100.0% PROCESSED       92 ITERATIONS                            18 ANSWERS
SEARCH TIME: 00.00.01

L5            18 SEA EXA FUL L4

=>

=>  D SCAN


L5   18 ANSWERS   REGISTRY  COPYRIGHT 2006 ACS on STN
IN   β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (9-cis,13-cis)-
     (9CI)
MF   C44 H56 O6

Double bond geometry as shown.
```

PAGE 1-A



PAGE 1-B



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**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**
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```
HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):no
'NO' IS NOT VALID HERE

To display more answers, enter the number of answers you would like to
see.  To end the display, enter "NONE", "N", "0", or "END".
HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):end

=>  FILE REG

COST IN U.S. DOLLARS                                  SINCE FILE       TOTAL
                                                           ENTRY     SESSION
FULL ESTIMATED COST                                        56.98       67.81

FILE 'REGISTRY' ENTERED AT 11:01:11 ON 14 NOV 2006
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DICTIONARY FILE UPDATES:   12 NOV 2006  HIGHEST RN 913055-81-9

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TSCA INFORMATION NOW CURRENT THROUGH June 30, 2006

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  conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and
predicted properties as well as tags indicating availability of
experimental property data in the original document.  For information
on property searching in REGISTRY, refer to:

http://www.cas.org/ONLINE/UG/regprops.html

=> STR 5800-87-3

REGISTRY NUMBER HAS BEEN REPLACED BY '25494-88-6'
:END

L6   STRUCTURE CREATED

=> S L6 EXA SAM

SAMPLE SEARCH INITIATED 11:01:14 FILE 'REGISTRY'
SAMPLE SCREEN SEARCH COMPLETED -        3 TO ITERATE

100.0% PROCESSED        3 ITERATIONS                             1 ANSWERS
SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS:  ONLINE   **COMPLETE**
                        BATCH    **COMPLETE**
PROJECTED ITERATIONS:             3 TO      163
PROJECTED ANSWERS:                1 TO       80

L7             1 SEA EXA SAM L6

=>
```
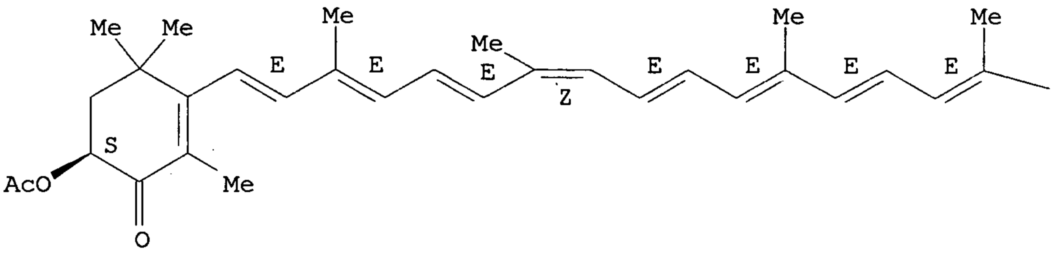
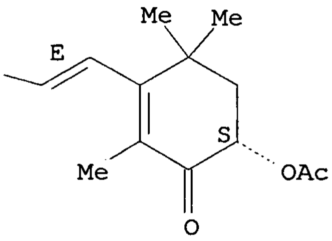

```
=>  D SCAN


L7    1 ANSWERS   REGISTRY  COPYRIGHT 2006 ACS on STN
IN    β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S,13-cis)-
      (9CI)
MF    C44 H56 O6

Absolute stereochemistry.
Double bond geometry as shown.
```

PAGE 1-A



PAGE 1-B



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**


ALL ANSWERS HAVE BEEN SCANNED


=> file caplus
COST IN U.S. DOLLARS                              SINCE FILE       TOTAL
                                                       ENTRY     SESSION
FULL ESTIMATED COST                                     1.32       69.13

FILE 'CAPLUS' ENTERED AT 11:03:05 ON 14 NOV 2006
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FILE LAST UPDATED: 12 Nov 2006  (20061112/ED)

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They are available for your review at:

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=> s 25494-88-6/prep
            13 25494-88-6
       3558058 PREP/RL
L8           7 25494-88-6/PREP
                 (25494-88-6 (L) PREP/RL)

=> s 25494-88-6/proc
            13 25494-88-6
       4004847 PROC/RL
L9           1 25494-88-6/PROC
                 (25494-88-6 (L) PROC/RL)

=> s l8 or l9
L10          8 L8 OR L9

=> s l10 and py<2002
      21842357 PY<2002
L11          6 L10 AND PY<2002

=> d 1-6 ibib abs hitstr

L11  ANSWER 1 OF 6  CAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:        1995:657594  CAPLUS
DOCUMENT NUMBER:         123:56329
TITLE:                   Improved process for preparation of astaxanthin
INVENTOR(S):             Ernst, Hansgeorg; Paust, Joachim; Dobler, Walter;
                         Rheude, Udo
PATENT ASSIGNEE(S):      BASF A.-G., Germany
SOURCE:                  Ger. Offen., 11 pp.
                         CODEN: GWXXBX
DOCUMENT TYPE:           Patent
LANGUAGE:                German
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:

     PATENT NO.          KIND    DATE          APPLICATION NO.        DATE
     ---------------     ----    --------      --------------------   --------
     DE 4430289           A1     19950309      DE 1994-4430289        19940826 <--
     FR 2709490           A1     19950310      FR 1994-10366          19940829 <--
     FR 2709490           B3     19951027
     JP 07082246          A2     19950328      JP 1994-211529         19940905 <--
PRIORITY APPLN. INFO.:                         DE 1993-4329954     A1 19930904
OTHER SOURCE(S):         CASREACT 123:56329; MARPAT 123:56329
GI   For diagram(s), see printed CA Issue.
AB   Astaxanthin (I) was prepd from the alc. II or the acetate III (R = AcO) in
     an improved process.  Thus, II was treated with 47% HBr in methylene
     chloride and the product III (R = Br) was treated with Ph3P to give the
     crystalline phosphonium bromide, which underwent Wittig reaction with
     2,7-dimethylocta-2,4,6-trien-1,8-dial to give astaxanthin.
IT   25494-88-6P
     RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic
     preparation); PREP (Preparation); RACT (Reactant or reagent)
```
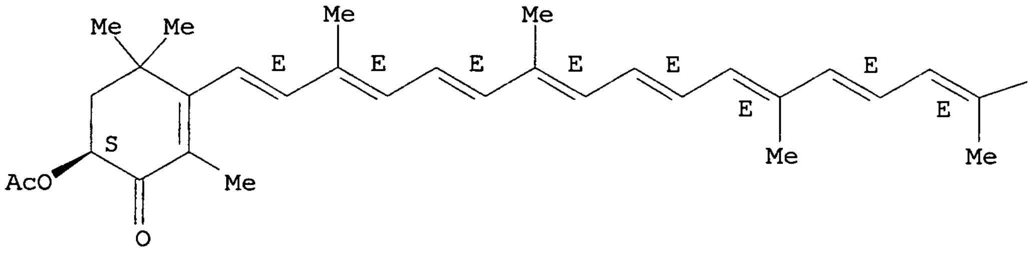
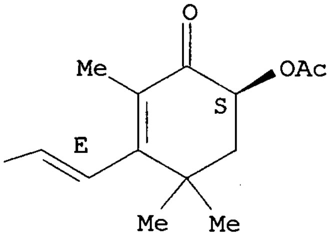

(improved process for preparation of astaxanthin)
RN 25494-88-6 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI)
(CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



PAGE 1-B



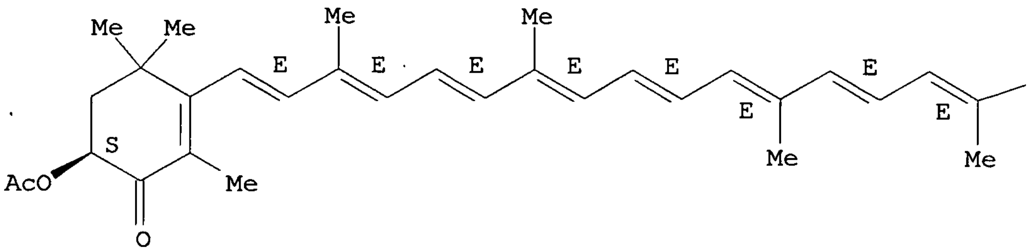
L11 ANSWER 2 OF 6 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:3493 CAPLUS
DOCUMENT NUMBER: 118:3493
TITLE: Algal carotenoids. 51. Secondary carotenoids 2. Haematococcus pluvialis aplanospores as a source of (3S,3'S)-astaxanthin esters
AUTHOR(S): Grung, Merete; D'Souza, Frances M. L.; Borowitzka, Michael; Liaaen-Jensen, Synnove
CORPORATE SOURCE: Norw. Inst. Technol., Univ. Trondheim, Trondheim, N-7034, Norway
SOURCE: Journal of Applied Phycology (1992), 4(2), 165-71
CODEN: JAPPEL; ISSN: 0921-8971
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Aplanospores of H. pluvialis MUR 145 contained 0.7% carotenoids (dry weight basis) consisting of β,β-carotene (5% of total carotenoid), echinenone (4%), canthaxanthin (4%), (3S,3'S)-astaxanthin diester (34%), (3S,3'S)-astaxanthin monoester (46%), (3S,3'S)-astaxanthin (1%) and (3R,3'R,6'R)-lutein (6%). The astaxanthin esters were examined by TLC and HPLC and visible, 1H NMR, and mass spectra recorded. Their chirality was determined by the camphanate method after anaerobic hydrolysis. The tough cell wall of the aplanospores required enzymic treatment prior to pigment extraction The potential use of this microalga as a feed ingredient in aquaculture is discussed briefly.

IT 25494-88-6P
RL: SPN (Synthetic preparation); PREP (Preparation)
(of Haematococcus pluvialis aplanospores, preparation and identification of)
RN 25494-88-6 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI)
(CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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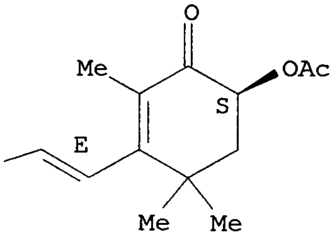


L11 ANSWER 3 OF 6 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	1979:138054 CAPLUS
DOCUMENT NUMBER:	90:138054
TITLE:	Synthesis of optically active natural carotenoids and structurally related compounds. II. Synthesis of (3S,3'S)-astaxanthin
AUTHOR(S):	Kienzle, Frank; Mayer, Hans
CORPORATE SOURCE:	Pharm. Forschungsabt., F. Hoffmann-La Roche und Co. A.-G., Basel, Switz.
SOURCE:	Helvetica Chimica Acta (1978), 61(7), 2609-15 CODEN: HCACAV; ISSN: 0018-019X
DOCUMENT TYPE:	Journal
LANGUAGE:	German

GI

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB (3S,3'S)-astaxanthin (I, R = H) was prepared by hydrogenation of cyclohexenone II (R1 = C.tplbond.CCMe:CHCHO), reduction of II (R1 = R2, R3 =

CHO), bromination of the alc. II (R1 = R2, R3 = CH2OH), substitution of II (R1 = R2, R3 = CH2Br with Ph3P, and condensation of II [R1 = (E,E)-CH:CHCMe:CHCH2P+Ph3.Br-] (III) with (E,E,E)-OCHCMe:CHCH:CHCH:CMeCHO. Condensing III with (E,E)-OCHCMe:CHC.tplbond.CCH:CMeCHO gave (3S,3S')-didehydroasataxanthin (IV), which was hydrogenated to (3S,3S')-cis-astaxanthin (V). (3S,3'S)-astaxanthin diacetate and dipalmitate (I, R = Ac, palmitoyl, resp.) were also prepared

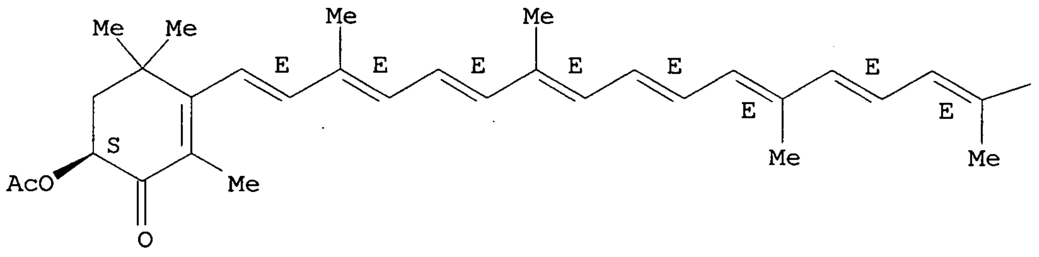
IT 25494-88-6P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

RN 25494-88-6 CAPLUS

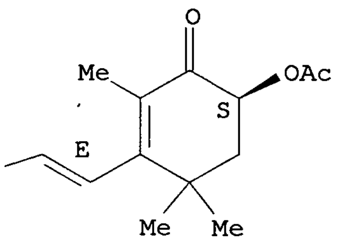
CN β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



PAGE 1-B



L11 ANSWER 4 OF 6 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1975:82658 CAPLUS
DOCUMENT NUMBER: 82:82658
TITLE: Algal carotenoids. X. Carotenoids of the Dinophyceae
AUTHOR(S): Johansen, J. E.; Svec, W. A.; Liaaen-Jensen, S.; Haxo, F. T.
CORPORATE SOURCE: Norw. Inst. Technol., Univ. Trondheim, Trondheim, Norway
SOURCE: Phytochemistry (Elsevier) (1974), 13(10), 2261-71
CODEN: PYTCAS; ISSN: 0031-9422
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The carotenoids of the photosynthetic dinoflagellates Amphidinium carterae (2 strains), Glenodinium, Gymnodinium splendens, Gymnodinium nelsoni, and Gyrodinium dorsum have been investigated. Peridinin is the principal carotenoid in all species; also present are β-carotene, diadinoxanthin, dinoxanthin, pyrrhoxanthin, astaxanthin, peridininol, diatoxanthin, and pyrrhoxanthinol. New structures have been assigned to dinoxanthin and pyrrhoxanthin, while peridininol and pyrrhoxanthinol are new carotenoids not previously reported. A carotenoid glycoside, P-457, found in 4 species, is a hexoside. Dinoxanthin is the only plausible biosynthetic precursor of peridinin that could be detected.

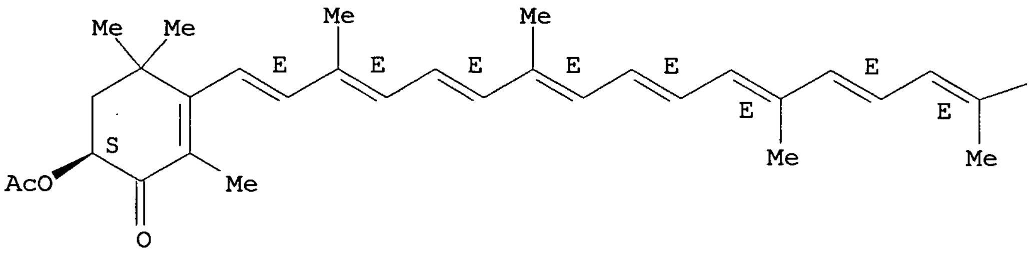
IT 25494-88-6P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

RN 25494-88-6 CAPLUS

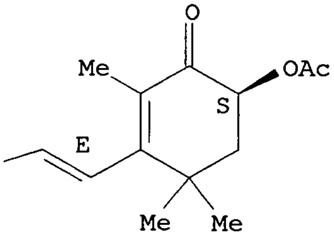
CN β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI)
(CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



PAGE 1-B



L11 ANSWER 5 OF 6 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	1970:21796 CAPLUS
DOCUMENT NUMBER:	72:21796
TITLE:	Optical rotatory dispersion of carotenoids
AUTHOR(S):	Bartlett, L.; Klyne, W.; Mose, W. P.; Scopes, Patricia M.; Galasko, G.; Mallams, A. K.; Weedon, B. C. L.; Szabolcs, J.; Toth, Gyula
CORPORATE SOURCE:	Westfield Coll., London, UK
SOURCE:	Journal of the Chemical Society [Section] C: Organic (1969), (18), 2527-44 CODEN: JSOOAX; ISSN: 0022-4952
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB The ORD curves of approx. 40 carotenoids were measured, chiefly in dioxane at 400-200 nm. The chromophore in all cases is a conjugated polyene system which is perturbed by one or two chiral end-groups. The curves are analyzed in terms of the simple additivity of the effects of end-groups, and the absolute configurations of several compds. were provisionally assigned.

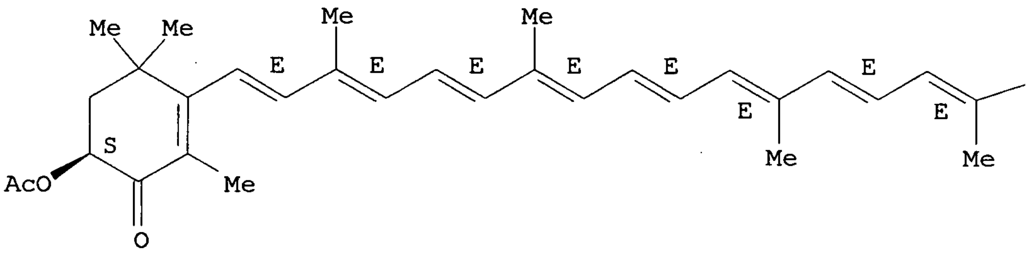
IT 25494-88-6
RL: PROC (Process)
(optical rotatory dispersion of)

RN 25494-88-6 CAPLUS

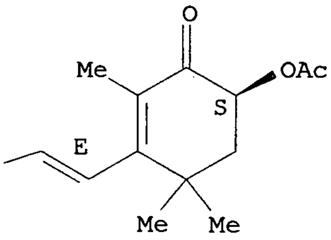
CN β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



PAGE 1-B



L11 ANSWER 6 OF 6 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	1967:500271 CAPLUS
DOCUMENT NUMBER:	67:100271
TITLE:	Pectenoxanthin, cynthiaxanthin, and a new acetylenic carotenoid, pectenolone
AUTHOR(S):	Campbell, Sally A.; Mallams, A. K.; Waight, Eric S.; Weedon, Basil C. L.
CORPORATE SOURCE:	Univ. London, London, UK
SOURCE:	Chemical Communications (London) (1967), (18), 941-2 CODEN: CCOMA8; ISSN: 0009-241X
DOCUMENT TYPE:	Journal
LANGUAGE:	English

GI For diagram(s), see printed CA Issue.

AB Halocynthia papillosa carotenoids were separated by thin layer chromatog. (TLC) on Kieselgel to give cynthiaxanthin (I), m. 188-90°. Acetylated carotenoids on Al2O3 gave the diacetates, m. 154-6°, of I, pectenolone (II), and astaxanthin m. 198-9°. Pecten maximus gonad-acetylated carotenoids gave by TLC the diacetates of pectenoxanthin, m. 154-7°, and II. The uv, ir, N.M.R. and mass spectral data of the separated products were given. The structure of II was assigned as shown. Acetylated carotenoids of mussel showed on TLC, 2 main pigments, one m. 150-2°, but no zeaxanthin.

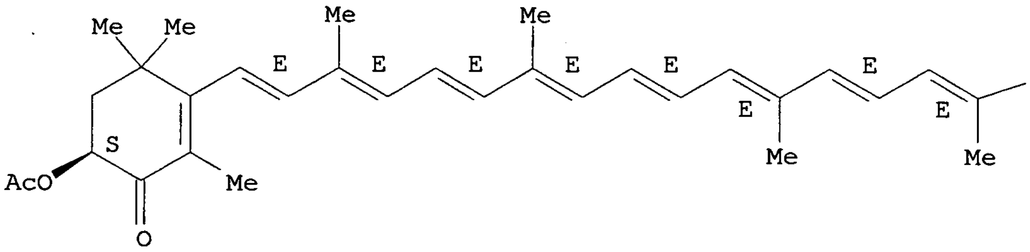
IT 25494-88-6P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

RN 25494-88-6 CAPLUS

CN β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI)
(CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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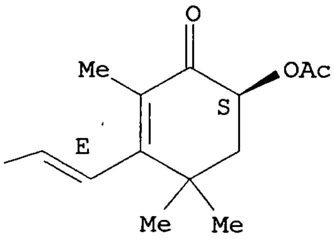

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=> d 1-8 ibib abs hitstr

L13  ANSWER 1 OF 8  CAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:         2001:483610  CAPLUS
DOCUMENT NUMBER:          135:254257
TITLE:                    Astaxanthin accumulation in Haematococcus requires a
                          cytochrome P450 hydroxylase and an active synthesis of
                          fatty acids
AUTHOR(S):                Schoefs, B.; Rmiki, N.-E.; Rachadi, J.; Lemoine, Y.
CORPORATE SOURCE:         Plant Cytophysiology and Phycology, UPRESA CNRS 8013,
                          University of Lille 1, Villeneuve d'Ascq, F-59655, Fr.
SOURCE:                   FEBS Letters (2001), 500(3), 125-128
                          CODEN: FEBLAL; ISSN: 0014-5793
PUBLISHER:                Elsevier Science B.V.
DOCUMENT TYPE:            Journal
LANGUAGE:                 English
AB    Astaxanthin accumulation by green microalgae is a natural phenomenon known
      as red snows and blood rains.  The fact that astaxanthin synthesis
      requires oxygen, NADPH and Fe2+ led Cunningham and Gantt [Annu. Rev. Plant
      Physiol. Plant Mol. Biol. 49 (1998) 557-583] to propose that a cytochrome
      P 450-dependent enzyme might be involved in the transformation of
      β-carotene to astaxanthin.  In Haematococcus only  esterified
      astaxanthin mols. accumulate, but it is not determined whether a fatty
      acid synthesis should occur simultaneously to allow pigment accumulation.
      The aim of this contribution was to answer these two questions using
      specific inhibitors of β-carotene (norflurazon) and fatty acid
      (cerulenin) synthesis, and of cytochrome P 450 enzyme activity
      (ellipticine).
IT    144-68-3, Zeaxanthin 472-61-7, Astaxanthin
      RL: BSU (Biological study, unclassified); MFM (Metabolic formation); BIOL
      (Biological study); FORM (Formation, nonpreparative)
         (astaxanthin accumulation in Haematococcus requires cytochrome P 450
         hydroxylase and active synthesis of fatty acids)
RN    144-68-3  CAPLUS
CN    β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI)  (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

                                                                PAGE 1-A
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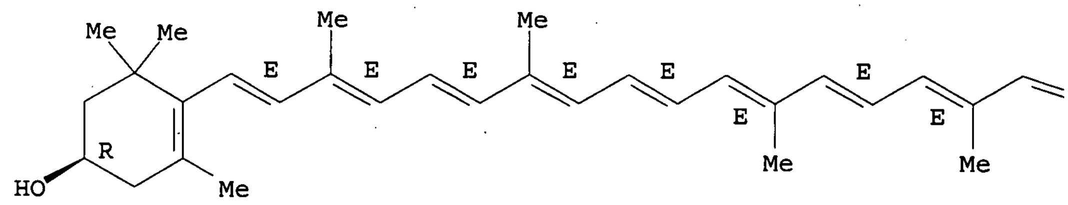

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                                                                PAGE 1-B
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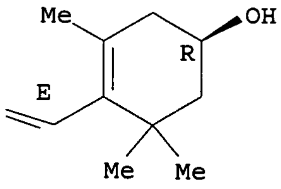

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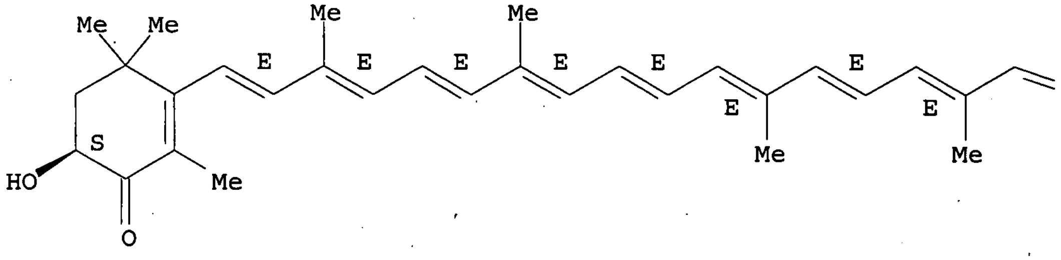
RN    472-61-7  CAPLUS
CN    β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI)  (CA
```

INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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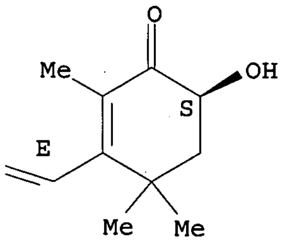


REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 2 OF 8 CAPLUS COPYRIGHT 2006 ACS on STN

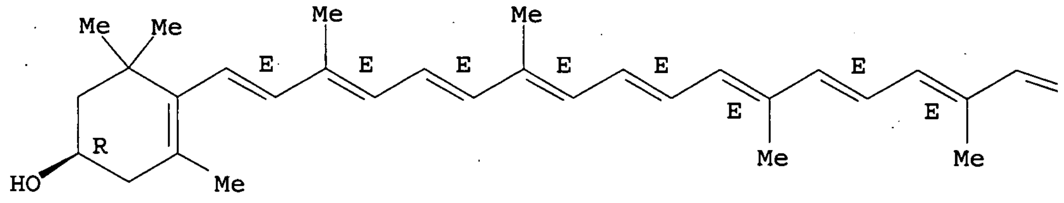
ACCESSION NUMBER:	2000:840580 CAPLUS
DOCUMENT NUMBER:	134:54122
TITLE:	The metabolism of astaxanthin during the embryonic development of the crayfish Astacus leptodactylus Eschscholtz (Crustacea, Astacidea)
AUTHOR(S):	Berticat, Olivier; Negre-Sadargues, Genevieve; Castillo, Rene
CORPORATE SOURCE:	Laboratoire d'Ecophysiologie des Invertebres, Universite Montpellier II, Sciences et Techniques, Montpellier, 34095, Fr.
SOURCE:	Comparative Biochemistry and Physiology, Part B: Biochemistry & Molecular Biology (2000), 127B(3), 309-318 CODEN: CBPBB8; ISSN: 0305-0491
PUBLISHER:	Elsevier Science Inc.
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB The developing eggs of the crayfish Astacus leptodactylus are found to contain important carotenoid amts. Free astaxanthin, mainly associated with protein and lutein represent the main pigments occurring in the yolk at the end of the embryonic period. Esterification processes affecting astaxanthin appear concomitantly with the resorption of vitellin reserves, the activation of the digestive gland and the rapid decrease of lutein amts. Esterified astaxanthin contents increase significantly within the interval between the juvenile stages I and II. Nevertheless, free astaxanthin levels appear insufficient to balance the amts. of the esterified form, scored at the end of the endotrophic period.

IT 144-68-3, Zeaxanthin 472-61-7, Astaxanthin
RL: BOC (Biological occurrence); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); OCCU (Occurrence); PROC (Process)
(astaxanthin metabolism during embryonic development of crayfish Astacus leptodactylus)
RN 144-68-3 CAPLUS
CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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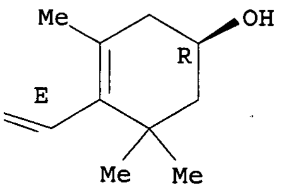
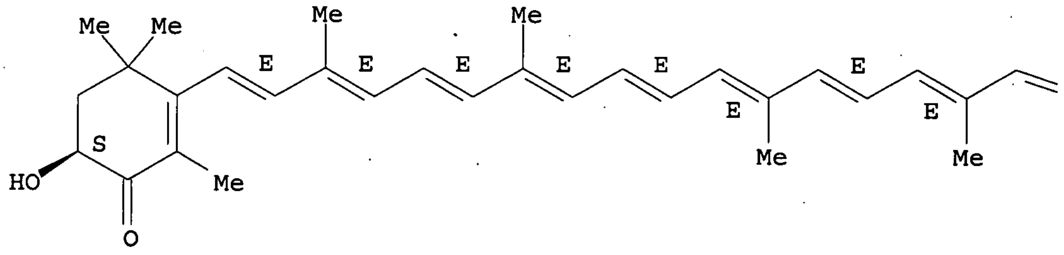
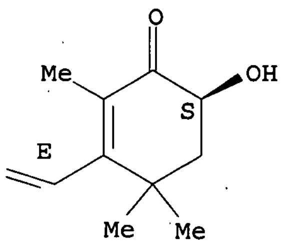


RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A





REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 3 OF 8 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	1995:313215 CAPLUS
DOCUMENT NUMBER:	122:104668
TITLE:	Metabolism of dietary carotenoids and effects to intensify the body color of cultured sea bass
AUTHOR(S):	Kang, Dong-Soo; Ha, Bong-Seuk
CORPORATE SOURCE:	Department of Food and Nutrition, Yosu National Fisheries University, Yosu, 550-749, S. Korea
SOURCE:	Han'guk Susan Hakhoechi (1994), 27(3), 272-81 CODEN: HSHKAW; ISSN: 0374-8111
PUBLISHER:	Korean Fisheries Society
DOCUMENT TYPE:	Journal
LANGUAGE:	Korean

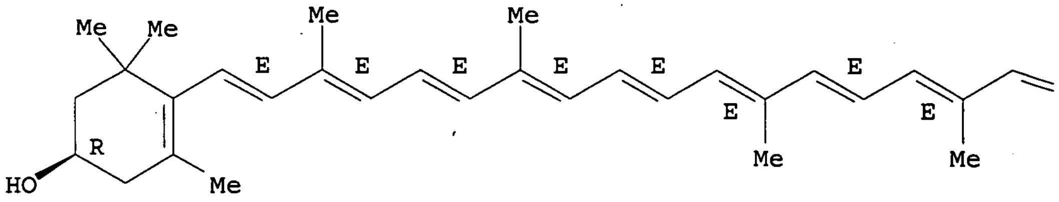
AB To investigate the effects on pigmentation and carotenoids metabolism of sea bass, Lateolabrax japonicus, by supplemented carotenoids, fish were fed the diets each containing β-carotene, lutein ester, astaxanthin, astaxanthin monoester and astaxanthin diester for 8 wk. Carotenoids in the integuments were analyzed. The important carotenoids in the integuments of sea bass were tunaxanthin and lutein. β-Carotene, β-cryptoxanthin, zeaxanthin and β-carotene triol were minor contributors. Differences in the content of β-carotene, tunaxanthin fraction and lutein were observed between the natural and cultured sea bass. The wild sea bass contained higher amts. of tunaxanthin fraction and lutein, but contained lower amts. of β-carotene than cultured sea bass. In cultured sea bass with supplemented carotenoids, carotenoid deposition was higher in order of astaxanthin monoester group, astaxanthin group and astaxanthin diester group. Based on the contents and composition of carotenoids in each group after the feeding the exptl. diet. The metabolism of carotenoid in sea bass was presumed to be the reductive metabolic pathways: astaxanthin to tunaxanthin via β-carotene triol, zeaxanthin and lutein.

IT 144-68-3, Zeaxanthin 472-61-7, Astaxanthin
472-61-7D, Astaxanthin, diester
RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
(dietary carotenoid metabolism and effects on the intensification of body color in the cultured sea bass)

RN 144-68-3 CAPLUS
CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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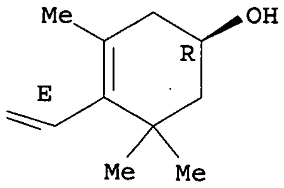
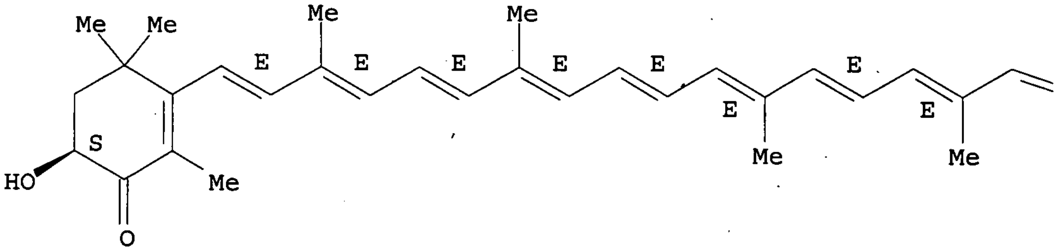


RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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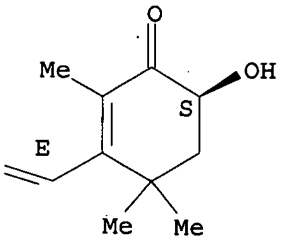
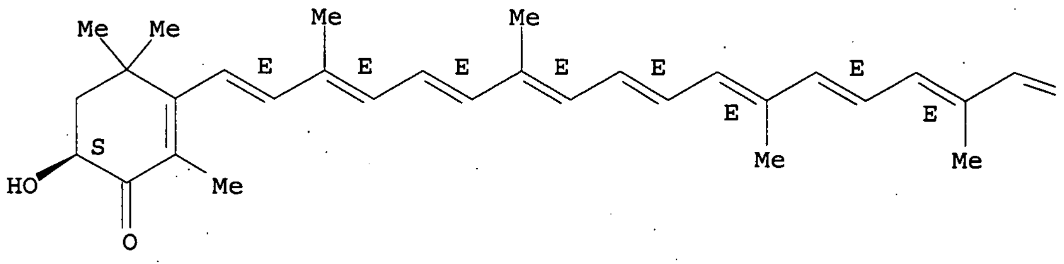


RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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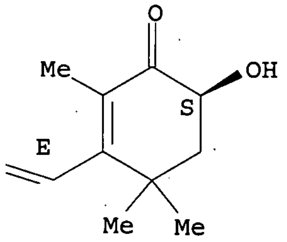


L13 ANSWER 4 OF 8 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	1994:76165 CAPLUS
DOCUMENT NUMBER:	120:76165
TITLE:	Metabolism of dietary carotenoids and their effect on the improvement of pigmentation of cultured flounder and red sea bream.
AUTHOR(S):	Ha, Bong Seuk; Kang, Dong Soo; Kim, Jong Hyun; Choi, Ok Soo; Ryu, Ho Young
CORPORATE SOURCE:	Dep. Food Nutr., Gyeongsang Natl. Univ., Jinju, 660-701, Fr.
SOURCE:	Han'guk Susan Hakhoechi (1993), 26(2), 91-101 CODEN: HSHKAW; ISSN: 0374-8111
DOCUMENT TYPE:	Journal
LANGUAGE:	Korean

AB To investigate the effects of supplemental carotenoids on pigmentation and carotenoid metabolism in red sea bream (Pagrus major) and flounder (Paralichthys olivaceus), fish were given diets containing β-carotene, lutein ester, astaxanthin, astaxanthin monoester, astaxanthin diester, and β-apo-8'-carotenal for 8 wks. Supplementation of cultured red sea bream with carotenoids increased carotenoid deposition and fish pigmentation in the following order: astaxanthin diester, β-apo-8'-carotenal, and astaxanthin monoester. The main carotenoids of red sea bream were astaxanthin diester, tunaxanthin, and β-carotene. A differences in the content of astaxanthin diester and β-carotene was observed in wild and cultured red sea bream. In cultured flounder supplemented with carotenoids, carotenoid deposition and pigmentation increased in the order: β-carotene group and lutein ester group. The main carotenoids of flounder were zeaxanthin and lutein. Differences in lutein and β-carotene contents were observed in wild and cultured flounder. Based on the level and composition of carotenoids in each group after feeding the exptl. diets, carotenoids in red sea bream were metabolized in the reductive pathway, astaxanthin to tunaxanthin, and likewise, in flounder, lutein to tunaxanthin.

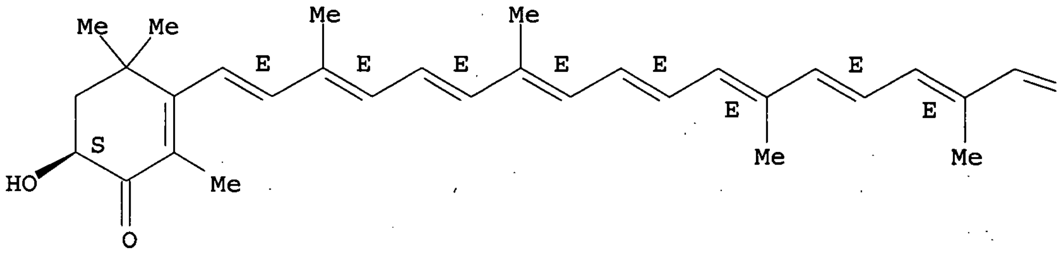
IT 472-61-7, Astaxanthin 472-61-7D, Astaxanthin, esters

RL: BIOL (Biological study)
(carotenoid metabolism and pigmentation of flounder and red sea bream response to dietary)

RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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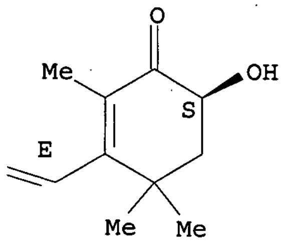
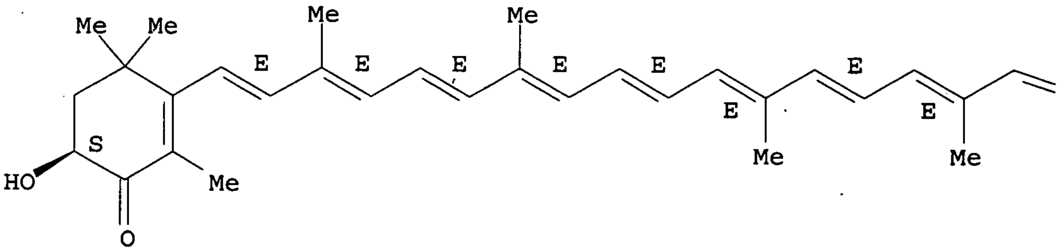


RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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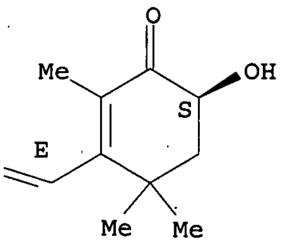
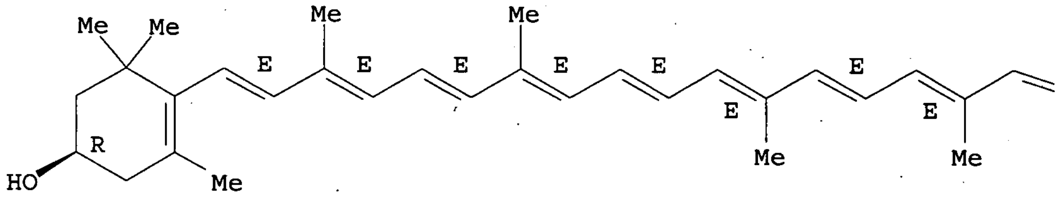


IT   144-68-3, Zeaxanthin
     RL: BIOL (Biological study)
        (of flounder and red sea bream, dietary carotenoids effect on, pigmentation in relation to)
RN   144-68-3 CAPLUS
CN   β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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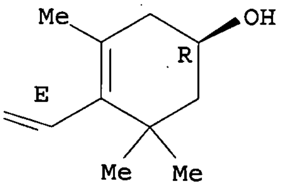


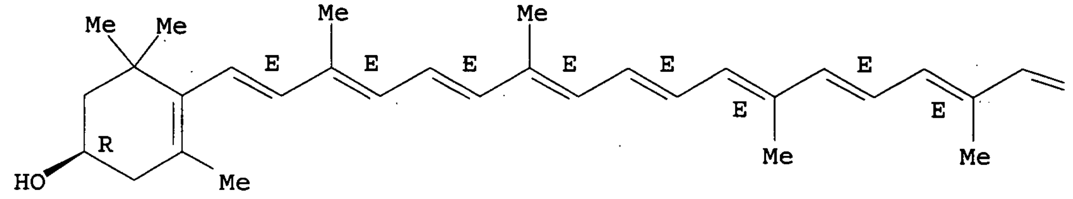
L13 ANSWER 5 OF 8 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1983:15637 CAPLUS
DOCUMENT NUMBER: 98:15637
TITLE: Carotenoids in fish. XXXII. Content of carotenoids in eggs utilized in the form of caviar
AUTHOR(S): Czeczuga, B.
CORPORATE SOURCE: Dep. Gen. Biol., Med. Acad., Bialystok, 15-230, Pol.
SOURCE: Folia Histochemica et Cytochemica (1982), 20(1-2), 63-8
CODEN: FHCYAI; ISSN: 0015-5586
DOCUMENT TYPE: Journal
LANGUAGE: English

AB   Caviar from 4 species of fish contained β-carotene [7235-40-7], β-cryptoxanthin [472-70-8], echinenone [432-68-8], canthaxanthin [514-78-3], lutein [127-40-2], tunaxanthin [12738-95-3], isozeaxanthin [29065-03-0], zeaxanthin [144-68-3], salmoxanthin [75138-59-9], adonixanthin [4418-73-9], adonixanthin ester, astaxanthin [472-61-7], and astaxanthin ester. Total carotenoids varied from 0.229 in Theragra chalcogramma caviar to 1.669

μg/g fresh weight in Oncorhynchus nerka.
IT 144-68-3 472-61-7
RL: BIOL (Biological study)
(of caviar)
RN 144-68-3 CAPLUS
CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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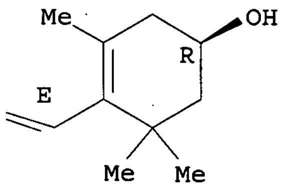
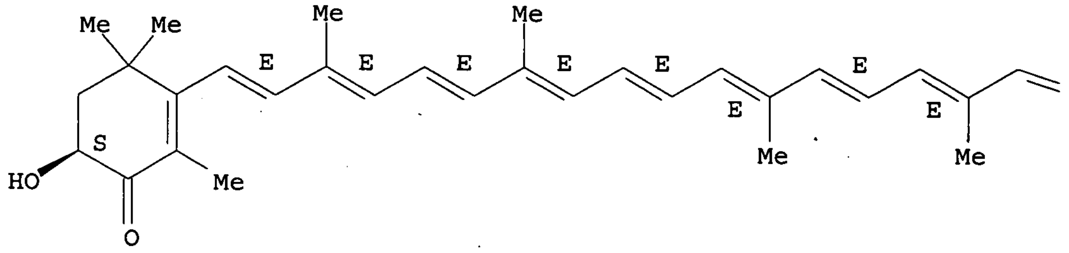


RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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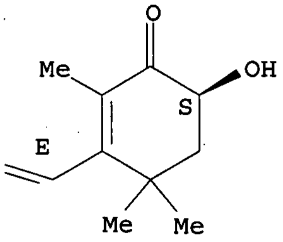


L13 ANSWER 6 OF 8 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	1981:44386 CAPLUS
DOCUMENT NUMBER:	94:44386
TITLE:	Carotenoids of Antarctic krill (Euphausia superba Dana, Euphausia crystallorophias Holt et Tattersall) in dependence on age structure and sex
AUTHOR(S):	Jackowska, Hanna; Czerpak, Romuald; Mical, Anna
CORPORATE SOURCE:	Inst. Ecol., Pol. Acad. Sci., Lomianki, 05-150, Pol.
SOURCE:	Polskie Archiwum Hydrobiologii (1980), 27(2), 291-303 CODEN: PAHYA2; ISSN: 0032-3764
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB In the juvenile and adult from of E. superba and E. crystallorophias the carotenoid content accounts for 50.43-152.16 μg/g dry matter. Most carotenoids were found in females (120.20-152.16 μ/g dry matter), and the least amount of carotenoids was in the juvenile forms with body length of 15-20 mm (50.43 μg/g dry matter) and in mature males (71.26 μg/g dry matter). There was a quant. predominance of free and esterified astaxanthin, cryptoxanthin, flavoxanthin, and the dihydroxy derivative of ϕ-carotene; the remaining identified carotenoids: β-carotene, canthaxanthin, lutein, zeaxanthin, and an unidentified polyoxyxanthophyll, occurred in small amts. (from some 10 to several μg/g dry matter).

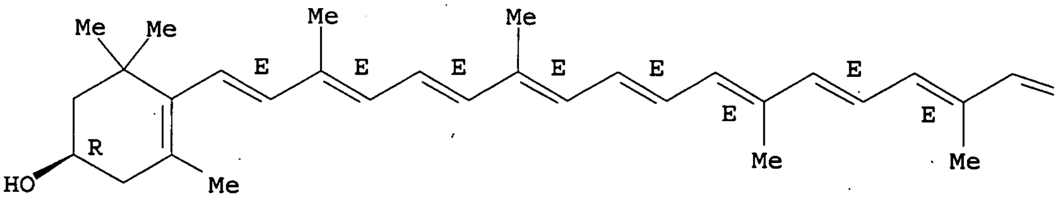
IT 144-68-3 472-61-7 472-61-7D, esters
RL: BIOL (Biological study)
(of Antarctic krill, in development, sex in relation to)

RN 144-68-3 CAPLUS

CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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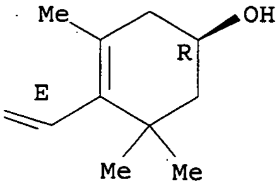
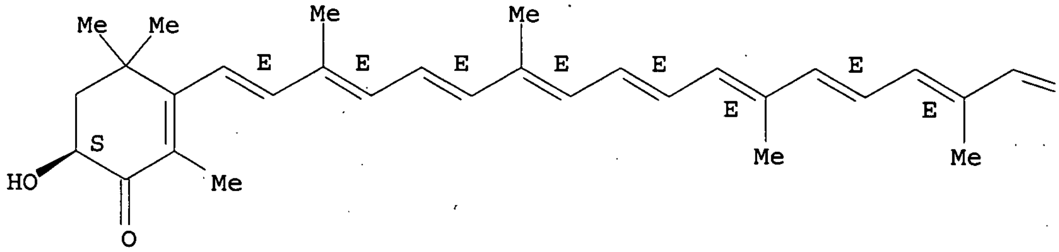


RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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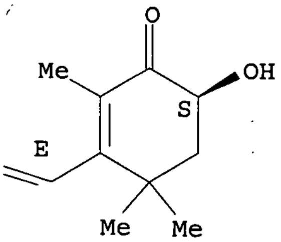
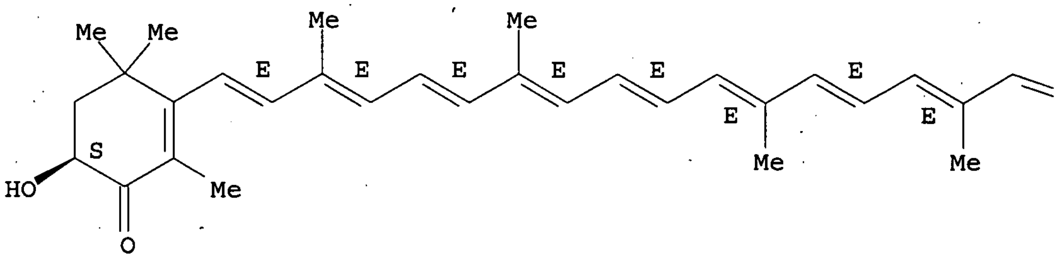


RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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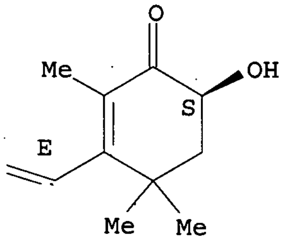


L13 ANSWER 7 OF 8 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	1977:530791 CAPLUS
DOCUMENT NUMBER:	87:130791
TITLE:	Investigations of carotenoids in some animals of the Adriatic Sea. V. Echinodermata
AUTHOR(S):	Czeczuga, Bazyli
CORPORATE SOURCE:	Dep. Gen. Biol., Med. Acad., Bialystok, Pol.
SOURCE:	Hydrobiologia (1977), 54(2), 177-80 CODEN: HYDRB8; ISSN: 0018-8158
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB Carotenoids in Echinodermata from the Adriatic Sea were identified by column and thin-layer chromatog. Coscinasterias tenuispina contained β-carotene, isocryptoxanthin, lutein, lutein 5,6-epoxide, 4-hydroxy-4-keto-β-carotene, zeaxanthin, astaxanthin, and asterinic acid. Marthasterias glacialis contained β-carotene, echinenone, cryptoxanthin, lutein, lutein 5,6-epoxide, 4-hydroxy-4-keto-β-carotene, zeaxanthin, astaxanthin ester, astaxanthin, and 3,4-didehydro-α-carotene. Paracentrotus lividus contained β-carotene, echinenone, cryptoxanthin, isocryptoxanthin, lutein, lutein 5,6-epoxide, 4-hydroxy-4-keto-β-carotene, zeaxanthin, astaxanthin, astaxanthin ester, and asterinic acid. Sphaerechinus granularis contained β-carotene, echinenone, cryptoxanthin, lutein, lutein 5,6-epoxide, astaxanthin, and guaraxanthin.

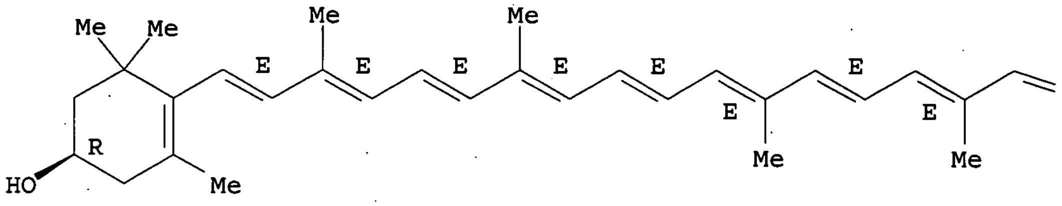
IT 144-68-3 472-61-7 472-61-7D, esters
RL: BOC (Biological occurrence); BSU (Biological study, unclassified); BIOL (Biological study); OCCU (Occurrence)
(of echinoderms)

RN 144-68-3 CAPLUS

CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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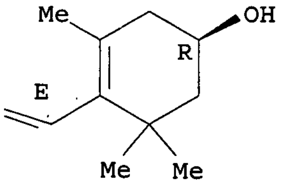
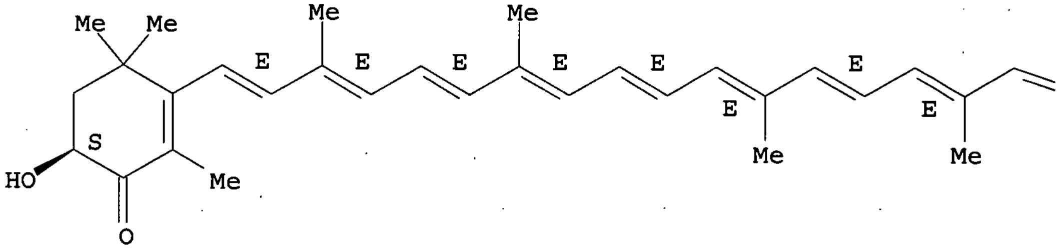


RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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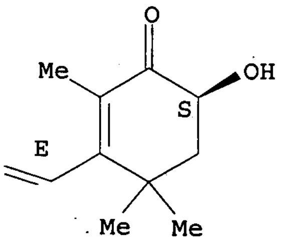
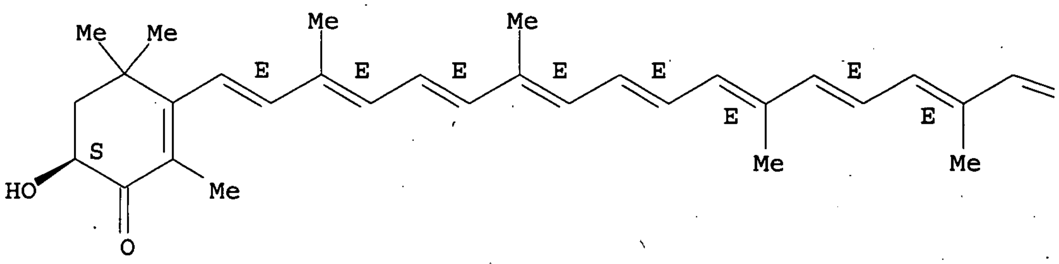


RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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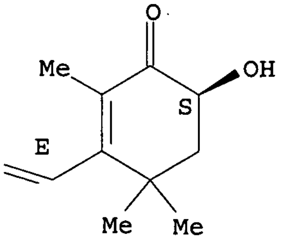


L13 ANSWER 8 OF 8 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1967:451477 CAPLUS
DOCUMENT NUMBER: 67:51477
TITLE: Carotenoid fractionation in the plumose anemone Metridium
AUTHOR(S): Fox, Denis L.; Crozier, George F.; Smith, Vann Elliott
CORPORATE SOURCE: Univ. of California, La Jolla, CA, USA
SOURCE: Comparative Biochemistry and Physiology (1967), 22(1), 17-88
CODEN: CBCPAI; ISSN: 0010-406X
DOCUMENT TYPE: Journal
LANGUAGE: English

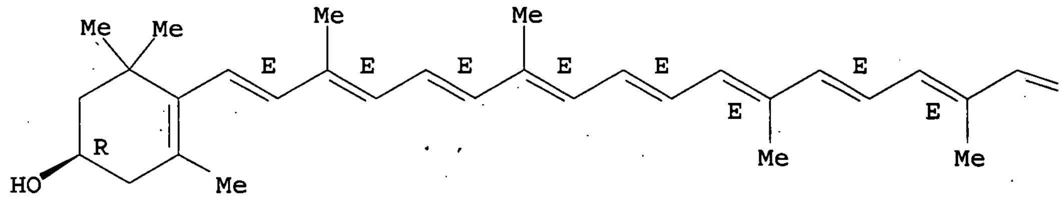
AB Several color variants of the Pacific Coast plumose anemone, M. senile fimbriatum, and the red form of the British species, M. senile senile, yielded astaxanthin esters as the preponderant carotenoid fraction stored in somatic or in gonadal tissues. White males assimilated no carotenoid from a protracted diet of finely divided salmon flesh, rich in astaxanthin. Nor did the whole body of a large, mature white male yield more than traces of astaxanthin or of any other carotenoid. Pacific Coast Metridium with white, red, or various shades of brown somatic tissues stored in their gonads various concns. of carotenoids, predominately esterified astaxanthin. Somatic tissues of colored types, including red variants from Britain, likewise yield astaxanthin esters, mostly epiphasic, but with some ambiphasic, in systems of hexane +95% MeOH. Esters of zeaxanthin (or certainly of a neutral xanthophyll exhibiting zeaxanthin's spectral and partitional properties) were usually present, while minor amts. of unfamilar ketones or hydroxyketones were of occasional incidence. Red specimens from Britain likewise yielded zeaxanthin and its esters, as well as occasional minor quantities of acidogenic carotenoid esters (or the free compound) different from astaxanthin. No carotenes were detected in either species. M. senile fimbriatum exhibits some similarities to, and certain apparent differences from, its British relative, M. senile senile, with respect to the metabolic fractionation of dietary carotenoids. 11 references.

IT 144-68-3 472-61-7

RL: BIOL (Biological study)
(in sea anemones, taxonomy and)
RN 144-68-3 CAPLUS
CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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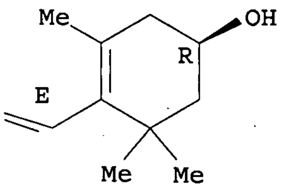
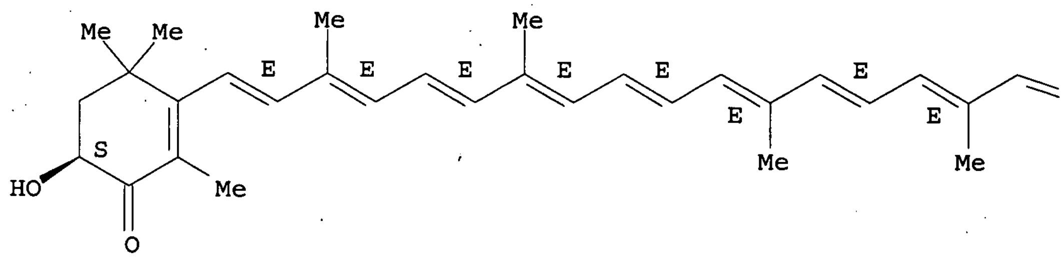


RN 472-61-7 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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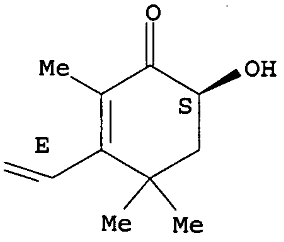

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Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.







L4        2409 L3


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L6        3894 L5


L7         622 L6 AND L4



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      21842443 PY<2002
L8         435 L7 AND PY<2002

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        914363 ESTER?
L9         117 L8 AND ESTER?

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         76337 ACYLAT?
L10          0 L8 AND ACYLAT?

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        208032 ACYL?
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        230711 ACETIC
        219256 ANHYDRIDE?
         23074 ACETIC ANHYDRIDE?
                 (ACETIC(W)ANHYDRIDE?)
L12          1 L8 AND ACETIC ANHYDRIDE?

=> d ibib abs hitstr

L12  ANSWER 1 OF 1  CAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:         1999:354471  CAPLUS
DOCUMENT NUMBER:          131:5399
TITLE:                    Short-chain diesters of zeaxanthin and an
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                         esterification process for their production from
                         saponified carotenoid plant extracts and their use as
                         intermediates and yellow food pigments
INVENTOR(S):             Torres, Cardona Mario David; Torres, Quiroga Jose Odon
PATENT ASSIGNEE(S):      Industrial Organica, S.A. De C.V., Mex.
SOURCE:                  PCT Int. Appl., 19 pp.
                         CODEN: PIXXD2
DOCUMENT TYPE:           Patent
LANGUAGE:                Spanish
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:

    PATENT NO.          KIND    DATE        APPLICATION NO.        DATE
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    WO 9926914           A1     19990603    WO 1998-MX52           19981125 <--
        W:  AU, BR, CA, CN, FI, JP, NO, NZ, SG, TR
        RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,
            PT, SE
    US 5959138           A      19990928    US 1997-969948         19971125 <--
    CA 2311394           AA     19990603    CA 1998-2311394        19981125 <--
    AU 9914458           A1     19990615    AU 1999-14458          19981125 <--
    BR 9814670           A      20001003    BR 1998-14670          19981125 <--
    EP 1044954           A1     20001018    EP 1998-958395         19981125 <--
    EP 1044954           B1     20030416
        R:  BE, CH, DE, ES, FR, GB, IT, LI, NL, PT
    JP 2001524463        T2     20011204    JP 2000-522072         19981125 <--
    PT 1044954           T      20030829    PT 1998-958395         19981125
    ES 2197518           T3     20040101    ES 1998-958395         19981125
    NO 2000002648        A      20000724    NO 2000-2648           20000524 <--
PRIORITY APPLN. INFO.:                      US 1997-969948      A  19971125
                                            WO 1998-MX52        W  19981125
AB    A product which has a high content of zeaxanthin, lutein, or a mixture of
      both (such as short chain organic acid diesters of zeaxanthin, lutein or a
      mixture of both), usable for the pigmentation of chicken skin and the egg
      yolks as well as an intermediate in the synthesis of cantaxanthin (i.e.,
      β,β-carotene-4,4'-dione) and astaxanthin (i.e.,
      3,3'-dihydroxy-β,β-carotene-4,4'-dione), is prepared by the
      esterification of saponified exts. obtained from French marigolds (i.e.,
      Tagetes erecta), or exts. of plants which contain lutein, zeaxanthin, or a
      mixture of both in any proportion, with propionic or acetic
      anhydride under controlled temperature and pressure conditions.
IT    144-68-3DP, Zeaxanthin, short-chain diesters
      RL: BOC (Biological occurrence); BSU (Biological study, unclassified); FFD
      (Food or feed use); IMF (Industrial manufacture); RCT (Reactant); BIOL
      (Biological study); OCCU (Occurrence); PREP (Preparation); RACT (Reactant
      or reagent); USES (Uses)
         (short-chain diesters of zeaxanthin and an esterification process for
         their production from saponified carotenoid plant exts. and their use as
         intermediates and yellow food pigments)
RN    144-68-3  CAPLUS
CN    β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI)  (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

                                             PAGE 1-A
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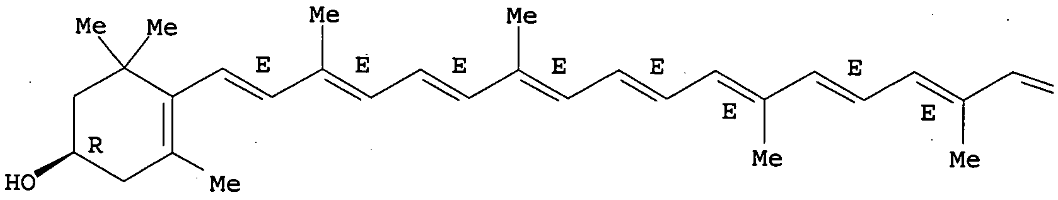

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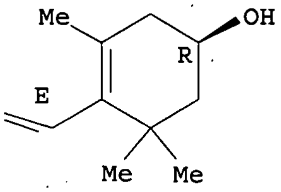


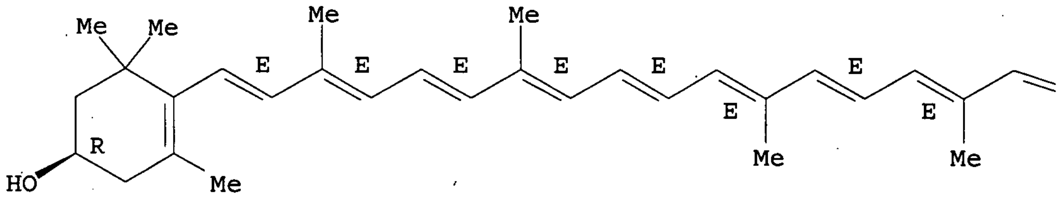
IT 144-68-3, Zeaxanthin
RL: BOC (Biological occurrence); BSU (Biological study, unclassified); RCT (Reactant); BIOL (Biological study); OCCU (Occurrence); RACT (Reactant or reagent)
(short-chain diesters of zeaxanthin and an esterification process for their production from saponified carotenoid plant exts. and their use as intermediates and yellow food pigments)

RN 144-68-3 CAPLUS

CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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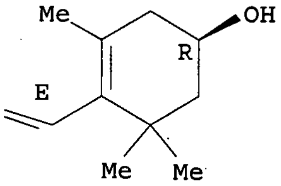


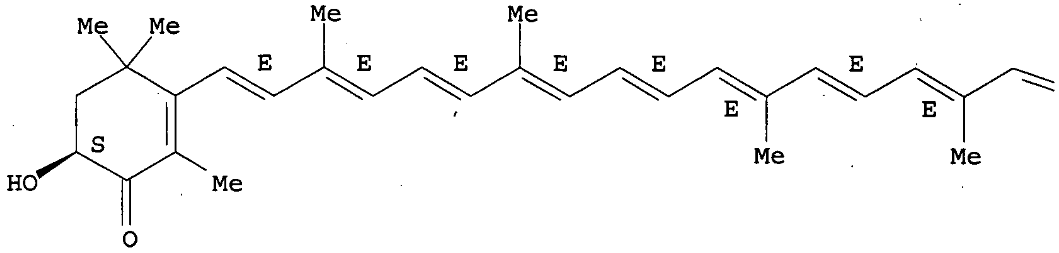
IT 472-61-7P, Astaxanthin
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(short-chain diesters of zeaxanthin and an esterification process for their production from saponified carotenoid plant exts. and their use as intermediates and yellow food pigments)

RN 472-61-7 CAPLUS

CN β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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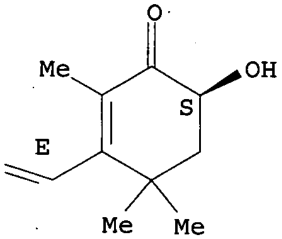

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L2            1 ZEAXANTHIN/CN

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L2   ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2006 ACS on STN
RN   144-68-3  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI)  (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN   β-Carotene-3,3'-diol, (3R,3'R)-all-trans- (6CI, 8CI)
CN   Zeaxanthin (7CI)
OTHER NAMES:
CN   (3R,3'R)-Zeaxanthin
CN   all-trans-Anchovyxanthin
CN   all-trans-Zeaxanthin
CN   Anchovyxanthin
CN   Anchovyxanthin, all-trans-
CN   Xanthophyll 3
CN   Zeaxanthin, all-trans-
CN   Zeaxanthol
FS   STEREOSEARCH
DR   32638-35-0, 34182-33-7
MF   C40 H56 O2
CI   COM
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       MEDLINE, MRCK*, NAPRALERT, PROMT, RTECS*, SPECINFO, TOXCENTER, USPAT2,
       USPATFULL, VETU
         (*File contains numerically searchable property data)
     Other Sources:   EINECS**
         (**Enter CHEMLIST File for up-to-date regulatory information)

Absolute stereochemistry.
Double bond geometry as shown.
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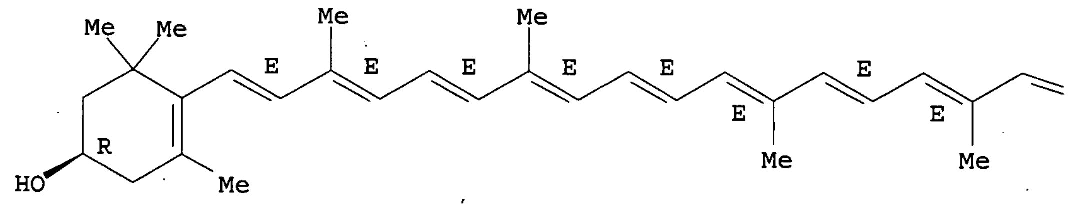
PAGE 1-A



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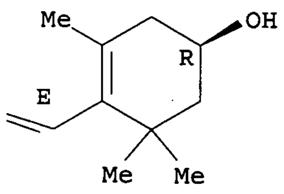

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          36 REFERENCES IN FILE CAOLD (PRIOR TO 1967)


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L1           1 ZEAXANTHIN/CN

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L1   ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2006 ACS on STN
RN   144-68-3  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI)  (CA INDEX NAME)
OTHER CA INDEX NAMES:
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CN   Zeaxanthin (7CI)
OTHER NAMES:
CN   (3R,3'R)-Zeaxanthin
CN   all-trans-Anchovyxanthin
CN   all-trans-Zeaxanthin
CN   Anchovyxanthin
CN   Anchovyxanthin, all-trans-
CN   Xanthophyll 3
CN   Zeaxanthin, all-trans-
CN   Zeaxanthol
FS   STEREOSEARCH
DR   32638-35-0, 34182-33-7
MF   C40 H56 O2
CI   COM
LC   STN Files:   ADISNEWS, AGRICOLA, ANABSTR, BEILSTEIN*, BIOSIS, BIOTECHNO,
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       MEDLINE, MRCK*, NAPRALERT, PROMT, RTECS*, SPECINFO, TOXCENTER, USPAT2,
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Absolute stereochemistry.
Double bond geometry as shown.
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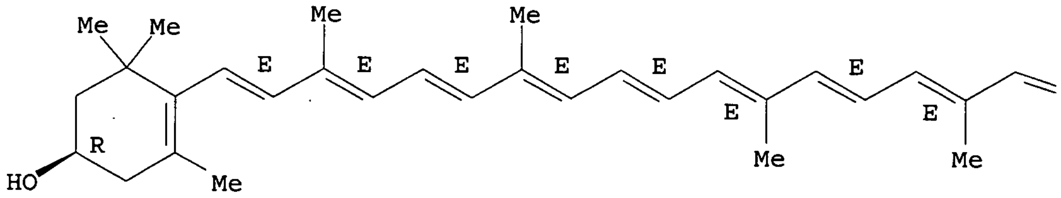
PAGE 1-A



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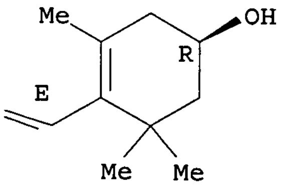

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FILE LAST UPDATED: 12 Nov 2006  (20061112/ED)

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L3          3877 L2


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L5            13 L4


L6             5 L5 AND L3
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ACCESSION NUMBER:         2005:1166320  CAPLUS
DOCUMENT NUMBER:          143:387199
TITLE:                    Process for the preparation of astaxanthin
INVENTOR(S):              Sanroma Virgili, Nuria; Fernandez Martin, Juan Antonio
PATENT ASSIGNEE(S):       Carotenoid Technologies, S.A., Spain
SOURCE:                   Span., 12 pp.
                          CODEN: SPXXAD
DOCUMENT TYPE:            Patent
LANGUAGE:                 Spanish
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.          KIND    DATE        APPLICATION NO.         DATE
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     ES 2223270           A1     20050216    ES 2003-926             20030410
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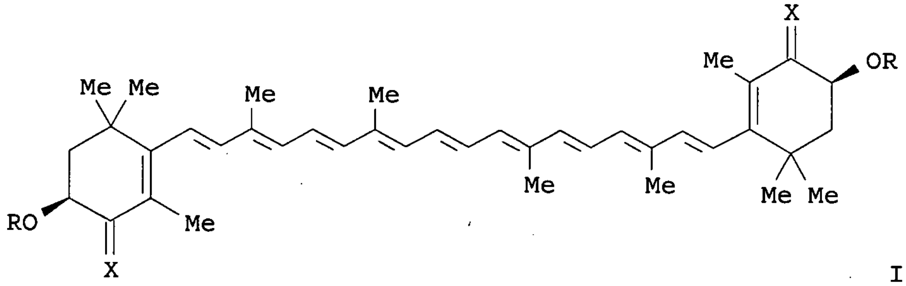

I

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AB   A procedure was disclosed for the preparation of astaxanthin I (R = H, X = O)
     and comprised di-O-acylation of the hydroxyl groups of zeaxanthin I (R =
     H, X = H2) using an acyl chloride or an acid anhydride, such as R1Cl or
     (R1)2O [R1 = COMe, COCH2Cl, palmitoyl, etc.], oxidation of the resulting
     di-O-acylated product I (R = COMe, COCH2Cl, palmitoyl, etc.; X = H2) using
     an oxidizing agent, such as PCC, to form the corresponding
     di-O-acyl-diketone I (X = O), and finally, saponification of the resulting
     di-O-acyl-diketone.
IT   25494-88-6P, Astaxanthin diacetate
     RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
     (Preparation)
        (process for the preparation of astaxanthin)
RN   25494-88-6  CAPLUS
CN   β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI)
     (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.
```
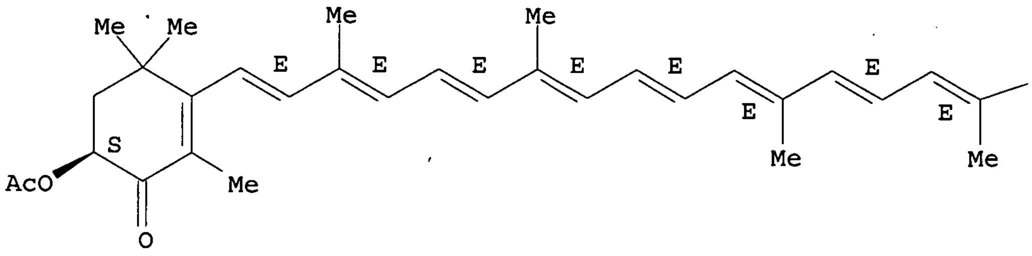

PAGE 1-A



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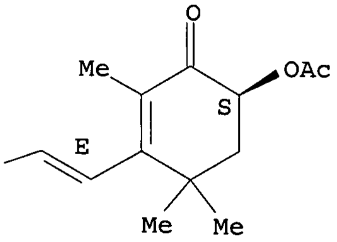
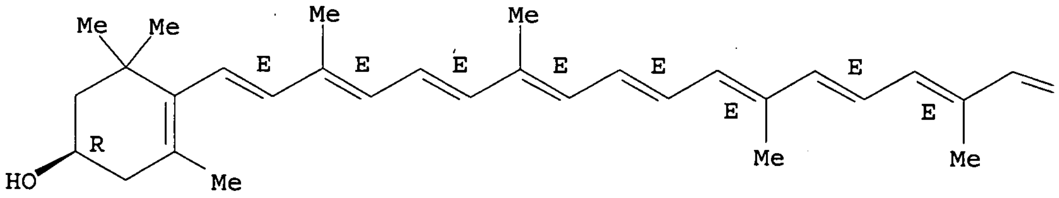


IT 144-68-3, Zeaxanthin
RL: RCT (Reactant); RACT (Reactant or reagent)
(process for the preparation of astaxanthin)
RN 144-68-3 CAPLUS
CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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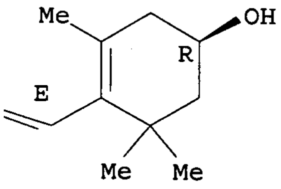


L6 ANSWER 2 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:583530 CAPLUS
DOCUMENT NUMBER: 143:225452
TITLE: On-line identification of secondary metabolites in

freshwater microalgae and cyanobacteria by combined liquid chromatography-photodiode array detection-mass spectrometric techniques

AUTHOR(S): Frassanito, Rita; Cantonati, Marco; Tardio, Massimiliano; Mancini, Ines; Guella, Graziano
CORPORATE SOURCE: Bioorganic Chemistry Laboratory, Department of Physics, University of Trento, Trento, I-38050, Italy

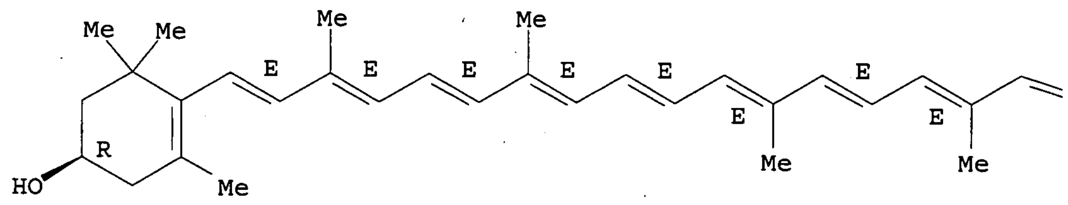
SOURCE: Journal of Chromatography, A (2005), 1082(1), 33-42
CODEN: JCRAEY; ISSN: 0021-9673
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The anal. and identification of a wide range of secondary metabolites biosynthesized by different algal taxa and cyanobacteria has been performed through a selective and sensitive methodol., mainly based on reversed-phase HPLC coupled both to UV photodiode array detection and to atmospheric pressure mass spectrometric techniques (HPLC-DAD-APIMS). Results are reported here with special attention to the analyses carried out both on the natural phytoplankton (mixed populations) of Lake Tovel (Northern Italy, Brenta Dolomites) and on enclosure-produced biomass of the dinoflagellate Glenodinium sanguineum Marchesoni (1941). This anal. procedure might represent a powerful tool for the fast screening of the taxonomic composition (broad groups, e.g., divisions) of natural mixed populations of phytoplankton, by providing a reliable distribution of accessory pigments extracted from microalgae, such as carotenoids and chlorophyll derivs. Furthermore, the authors showed that in the same chromatog. anal. other classes of natural products, such as galactolipids, alkaloids, sterols and mycosporine-like amino acids, can be detected by using combined optical and mass spectrometric techniques. These metabolites represent distinctive biochem. signatures, sometimes even at the species level.

IT 144-68-3, Zeaxanthin 25494-88-6
RL: ANT (Analyte); BSU (Biological study, unclassified); ANST (Analytical study); BIOL (Biological study)
(online identification of secondary metabolites in freshwater microalgae and cyanobacteria by combined liquid chromatog.-photodiode array detection-mass spectrometric techniques)
RN 144-68-3 CAPLUS
CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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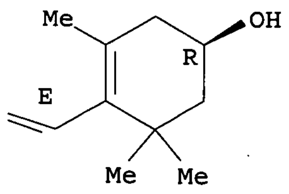

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RN   25494-88-6  CAPLUS
CN   β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI)
     (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

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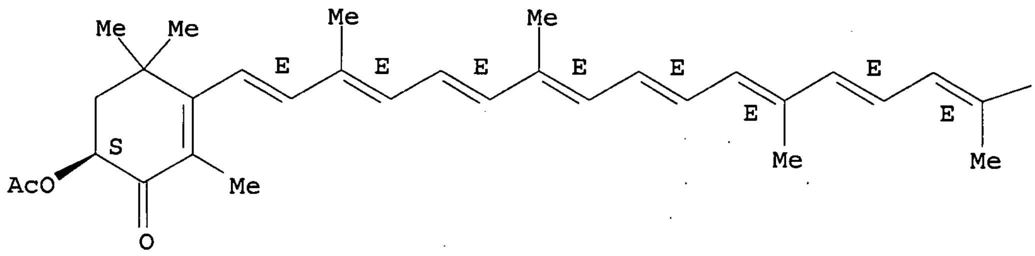

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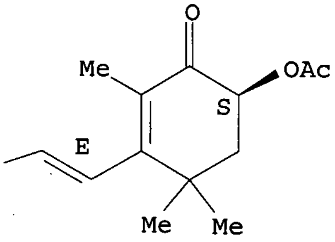

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REFERENCE COUNT:          25    THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS
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L6   ANSWER 3 OF 5  CAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:         2004:392604  CAPLUS
DOCUMENT NUMBER:          140:405911
TITLE:                    Method for producing esterified astaxanthin from
                          esterified zeaxanthin
INVENTOR(S):              Torres-cardona, Mario D.; Rodriguez, Gustavo;
                          Schloemer, George C.
PATENT ASSIGNEE(S):       Prodemex, S.A. De C.V., Mex.
SOURCE:                   PCT Int. Appl., 11 pp.
                          CODEN: PIXXD2
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
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     WO 2004039991        A2    20040513    WO 2003-US32681        20031014
     WO 2004039991        A3    20040708
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
             CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,
             GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,
             LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ,
             OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
             TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
         RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY,
             KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES,
             FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR,
             BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
     AU 2003277393          A1     20040525   AU 2003-277393          20031014
     US 2004158097          A1     20040812   US 2003-685194          20031014
     EP 1563081             A2     20050817   EP 2003-809947          20031014
         R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
             IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK
     CN 1703392             A      20051130   CN 2003-80101317        20031014
PRIORITY APPLN. INFO.:                        US 2002-421623P      P  20021025
                                              WO 2003-US32681      W  20031014
OTHER SOURCE(S):         MARPAT 140:405911
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AB   A method is described for preparing astaxanthin esters from zeaxanthin by acylation of zeaxanthin with an acylating agent followed by contacting the esterified zeaxanthin with an oxidizing agent to produce esterified astaxanthin. The astaxanthin esters are more stable and show a better bioavailability than free astaxanthin when used in salmonid pigmentation.

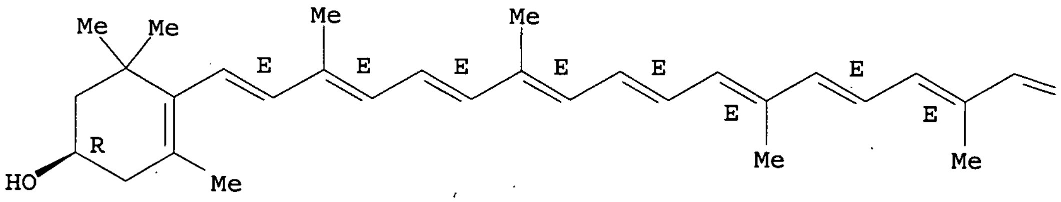
IT   144-68-3DP, Zeaxanthin, esters of
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); RCT (Reactant); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
(method for producing esterified astaxanthin from esterified zeaxanthin)

RN   144-68-3 CAPLUS

CN   β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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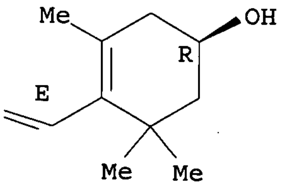


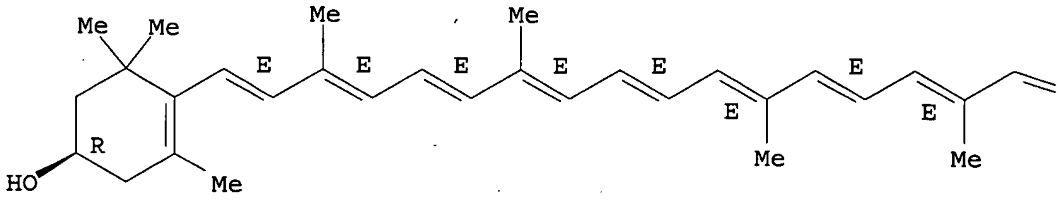
IT   144-68-3P, Zeaxanthin
RL: CPS (Chemical process); NPO (Natural product occurrence); PEP (Physical, engineering or chemical process); PUR (Purification or recovery); RCT (Reactant); BIOL (Biological study); OCCU (Occurrence); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
(method for producing esterified astaxanthin from esterified zeaxanthin)

RN   144-68-3 CAPLUS

CN   β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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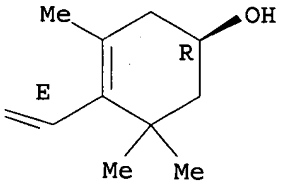
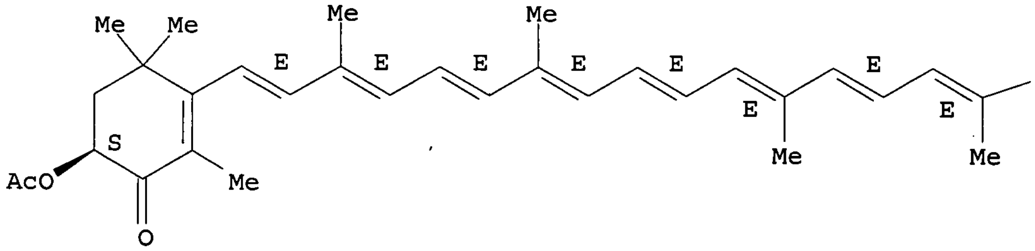


IT 25494-88-6P
RL: FFD (Food or feed use); IMF (Industrial manufacture); PUR (Purification or recovery); BIOL (Biological study); PREP (Preparation); USES (Uses)
(method for producing esterified astaxanthin from esterified zeaxanthin)
RN 25494-88-6 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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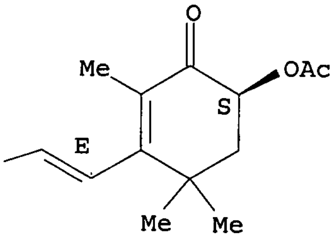


L6 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:254154 CAPLUS
DOCUMENT NUMBER: 132:288793
TITLE: Carotenoid esters for the prevention and treatment of eye diseases
PATENT ASSIGNEE(S): B.V. Werklust & Beheer, Neth.
SOURCE: Ger. Offen., 6 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
DE 19950327	A1	20000420	DE 1999-19950327		19991019
NL 1010351	A1	20000428	NL 1998-1010351		19981019
NL 1010351	C2	20010108			
PRIORITY APPLN. INFO.:			NL 1998-1010351	A	19981019

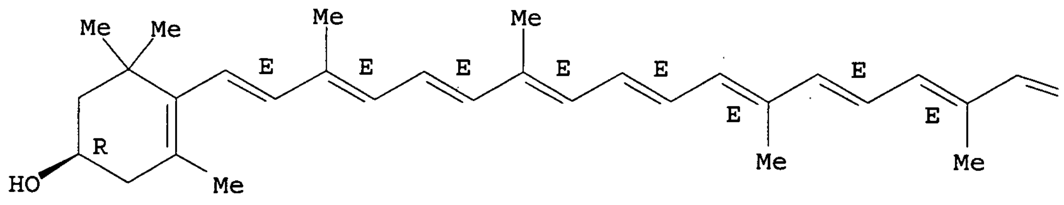
AB Carotenoid esters are used for the prevention and treatment of eye diseases. The carotenoids are xanthophylls, e.g. lutein, zeaxanthin, astaxanthin, kryptoxanthin and kanthaxanthin; the esters may be acetate, diacetate, succinate, or Disuccinate esters. The esters of the invention are more stable and thus longer lasting than the carotenoids themselves.

IT 144-68-3D, Zeaxanthin, esters 25494-88-6
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(carotenoid ester for prevention and treatment of eye disease)

RN 144-68-3 CAPLUS
CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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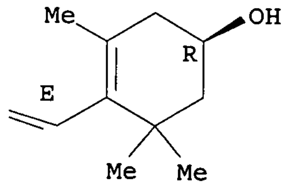
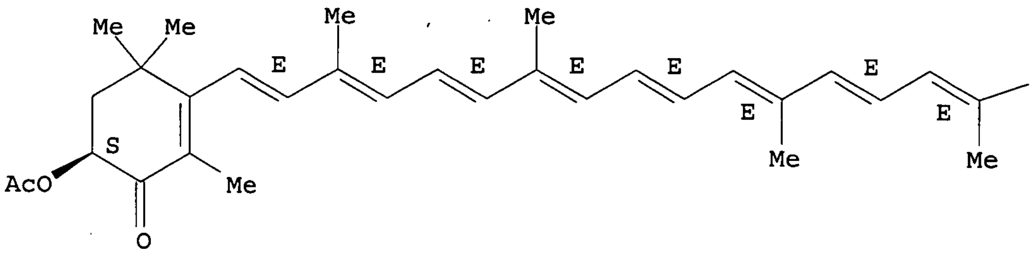


RN 25494-88-6 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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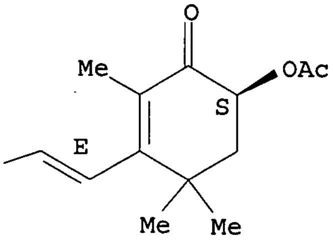


L6 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1970:21796 CAPLUS
DOCUMENT NUMBER: 72:21796
TITLE: Optical rotatory dispersion of carotenoids
AUTHOR(S): Bartlett, L.; Klyne, W.; Mose, W. P.; Scopes, Patricia M.; Galasko, G.; Mallams, A. K.; Weedon, B. C. L.; Szabolcs, J.; Toth, Gyula
CORPORATE SOURCE: Westfield Coll., London, UK
SOURCE: Journal of the Chemical Society [Section] C: Organic (1969), (18), 2527-44
CODEN: JSOOAX; ISSN: 0022-4952
DOCUMENT TYPE: Journal
LANGUAGE: English

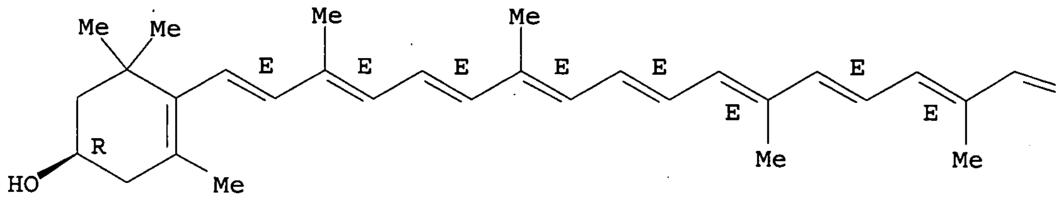
AB The ORD curves of approx. 40 carotenoids were measured, chiefly in dioxane at 400-200 nm. The chromophore in all cases is a conjugated polyene system which is perturbed by one or two chiral end-groups. The curves are analyzed in terms of the simple additivity of the effects of end-groups, and the absolute configurations of several compds. were provisionally assigned.

IT 144-68-3 25494-88-6
RL: PROC (Process)
(optical rotatory dispersion of)

RN 144-68-3 CAPLUS
CN β,β-Carotene-3,3'-diol, (3R,3'R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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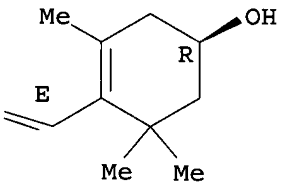
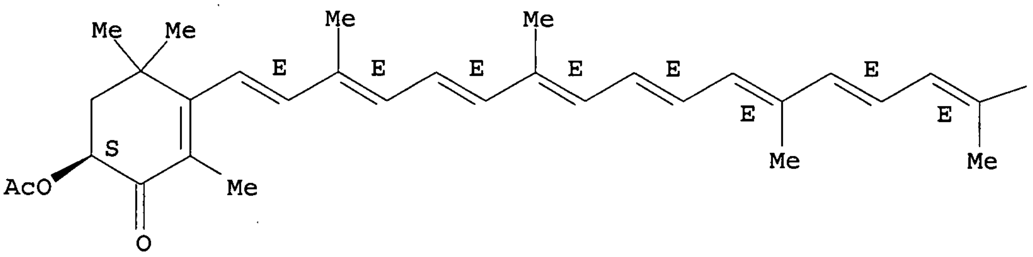


RN 25494-88-6 CAPLUS
CN β,β-Carotene-4,4'-dione, 3,3'-bis(acetyloxy)-, (3S,3'S)- (9CI)
(CA INDEX NAME)

Absolute stereochemistry.
Double bond geometry as shown.

PAGE 1-A



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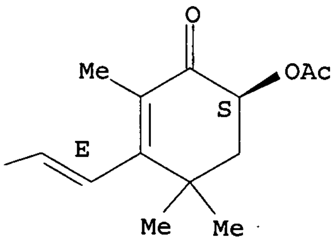

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=> s astaxanthin/cn
L1            1 ASTAXANTHIN/CN

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RN    472-61-7  REGISTRY
ED    Entered STN:  16 Nov 1984
CN    β,β-Carotene-4,4'-dione, 3,3'-dihydroxy-, (3S,3'S)- (9CI)  (CA
      INDEX NAME)
OTHER CA INDEX NAMES:
CN    β-Carotene-4,4'-dione, 3,3'-dihydroxy-, all-trans- (8CI)
CN    Astaxanthin (6CI)
OTHER NAMES:
CN    (3S,3'S)-all-trans-Astaxanthin
CN    (3S,3'S)-Astaxanthin
CN    (3S,3'S)-Astaxanthin
CN    all-trans-Astaxanthin
CN    AstaREAL
CN    Astaxanthin, all-trans-
CN    BioAstin
CN    BioAstin oleoresin
CN    Carophyll Pink
CN    Lucantin Pink
CN    Natupink
CN    NatuRose
CN    Ovoester
CN    trans-Astaxanthin
FS    STEREOSEARCH
DR    346585-67-9
MF    C40 H52 O4
CI    COM
LC    STN Files:   AGRICOLA, ANABSTR, BEILSTEIN*, BIOSIS, BIOTECHNO, CA, CABA,
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        DRUGU, EMBASE, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE, MRCK*, NAPRALERT,
        PROMT, RTECS*, SPECINFO, TOXCENTER, USPAT2, USPATFULL, VETU
          (*File contains numerically searchable property data)
      Other Sources:   EINECS**
          (**Enter CHEMLIST File for up-to-date regulatory information)

Absolute stereochemistry.
Double bond geometry as shown.

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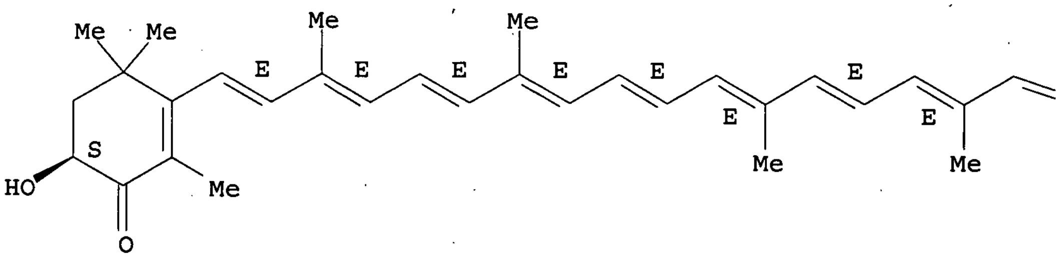

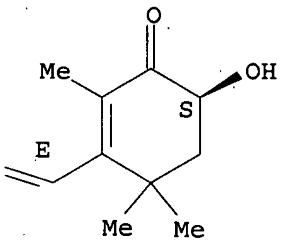

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             267 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
            2409 REFERENCES IN FILE CAPLUS (1907 TO DATE)
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